DECISION MOTIVATIONS: FACTORS GUIDING THE CHOICES OF AGRICULTURALISTS IN CALIFORNIA

A Thesis

by

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ABSTRACT

This study sought to highlight a specific area of California-agriculturalist behavior—decision-making—that may lend additional insight into how to begin bridging the communication gap between farmers and consumers. Communication between farmers in the United States and the general public is the overarching guidance for this mixed methods (QUAL → quan) study. Formations of organizations like the U.S. Farmers and Ranchers Alliance have begun to address the communication gap between agriculturalists and consumers through outreach.

The results of this study were limited to the study participants as the total response rate for the quantitative portion of the study was 21% (total response was 65 out of 300; useable responses $n = 30$). The study began with a series of qualitative interviews. The data from the qualitative interviews with California-based agriculturalists were analyzed to guide the creation of a survey instrument. The subsequent survey instrument was distributed to other California-based farmers requesting they rank a series of decision-making factors as they related to annual crop production.

Based upon the data collected, the decision-making factors identified in the qualitative strand of the study—water availability, soil quality, market, regulations, and labor—are more widely considered by farmers in California. Additional study is needed to further explore what other factors may guide annual planting decisions for agriculturalists in the state and country.

DEDICATION

To my parents for always pushing me to grant my own wishes

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CHAPTER I

INTRODUCTION AND LITERATURE REVIEW

The 2010 formation of the U.S. Farmers and Ranchers Alliance (USFRA) demonstrated the priority of communications between producers and consumers (Stallman, 2012). The creation of the USFRA also marked an expansion of communications from producers to consumers into an area of discourse well beyond the basic exchange of goods for funds. The United States Department of Agriculture (USDA) reported producers were beginning to take into account consumer desires and working backward from a food production standpoint to provide produce that specifically suited the needs and wants of consumers (Martinez & Stewart, 2003). Personal interactions with producers appear to have become more readily accessible through the reemergence of farmers' markets and consumer education-oriented outreach. Domestic research into the interactions between consumers and farmers appears to have lagged slightly behind research efforts elsewhere.

Outside the United States, researchers have started to examine food transparency and the effect it has on consumer willingness to purchase specific food items (Kriege- s Steffen, Boland, Lohscheidt, Schneider, & Stolze, 2010). In 2010, food transparency wa discussed at the 1st European Stakeholder Meeting: "Transparency in the Food Chain Situation, Expectations, Barriers, and Research Needs" in Brussels and included a working definition of food transparency as the communication between producers and consumers of food products (2010). From an economics perspective, transparency

includes “seeing through” the various parts of the production, purchasing and sales practices of all parties involved in the supply chain (Hultman & Axelsson, 2007). While Kriege-Steffen et al. (2010) focused on the organic food market in Germany, it is possible that the implications of organic food research noted by Kriege-Steffen et al. (2010) could be applied to traditional food production models. Providing open access information about producers on a personal level was explored during the Kriege-Steffen et al. (2010) study: through the use of a website, consumers were able to enter a producer identification number included on food packaging and access a small biography of the person who created/grew/raised the food item purchased (Kriege-Steffen et al., 2010).

Producers in the United States appear to have relied upon the outreach potential of their respective commodity groups for generations to provide a similar, if less personal, biography to that explored by Kriege-Steffen et al. (2010). Among those commodity groups, some do outreach to local, regional, and national populations with much success (see Washington Potato Commission, 1956). For example, in 2010, potatoes were slated for removal from the national school lunch program, when Washington State Potato Commission Executive Director Chris Voigt embarked on a 60-day, 20 potatoes-a-day diet to highlight the beneficial qualities of the tuber. The diet was widely publicized and so were the resulting benefits to Voigt’s health which included a 21-pound weight loss and declines in blood glucose, high blood pressure, and triglycerides numbers (20potatoesaday.com, 2010). Other commodity groups have taken up economic roles focused more on lobbying for the maintenance of market premiums

and producer success (see the American Corn Growers Association, 1987 and High Fructose Corn Syrup ad campaign, 2008). Outreach and education ventures similar to the diet undertaken by Voigt, were revealed in the form of television commercials pointing out to consumers that high fructose corn syrup is broken down by the body like any other sugar (mayoclinic.com, Sept. 27, 2012). Still, other commodity groups have chosen to remain in the background on issues of market share and producer survival (see the National Association of Wheat Growers, 1950).

Some independent producers, regardless of commodity or locale, have chosen to lobby on their own behalves (see Common Sense Agriculture Blog, 2010; Mess, 2011) via the Internet. Producers, particularly those with live products to market (e.g., cattle, hogs, sheep, etc.), have taken up their own outreach cause through blogs, Facebook and other social media, participation in direct marketing and advertising campaigns (see the Beef Checkoff Program, 1986), and several other avenues that provide them with the opportunity to put a human face on their product. For example, the Washington State Beef Commission began to post "producer profiles" on their website in 2011 in an effort to humanize beef production. Each profile gives a brief background about the featured rancher or ranching family, along with some personal touches like producer-provided recipes (wabeef.org, 2011). In addition to the producer profiles, the Washington State Beef Commission expanded their outreach to include another perspective, the "Ranch Wife Life" blog (wabeef.org, 2013) which features tidbits of ranch life from the perspective of a stay-at-home ranch wife. Traditional produce growers seem to have been slow to pick up the same idea but there appears to be a slow shift in a similar

direction (see Frank Martinez McDonalds commercials, 2012; featured growers in Lays Potato Chip commercials, 2012).

Anecdotal evidence, most notably the extreme privacy cultivated by many food producers in the United States and their reluctance to share information about their growing practices, suggests there is a need to further explore the food chain from the producer perspective. Dillman (2008) suggests that many farmers may not find benefit in participating in research because of what they believe is a personal cost of time or privacy, a questionnaire that is difficult to understand, or political affiliation. Reliance on contracts for planting directives, habitual planting of crops producers know how to grow, and own equipment for, and use of commodity market tracking rather than consumer requests, may also suggest that traditional produce growers in the United States are somewhat resistant to the introduction of transparency about their growing habits and decision-making behaviors. However, California-based producers seem more inclined to use direct marketing and other techniques to sell produce directly to consumers, and their approaches to communication have adapted to better address the needs of those consumers as evidenced by the number of farmers' markets throughout the state. According to the Agricultural Marketing Resource Center, there are 8,200 farmers' markets in the United States; California hosts more farmers' markets than any other state with 759 identified markets. The adaptation of producer habits on a small-scale potentially opens the door for larger-scaled forms of marketing and communications similar to those explored by Kriege-Steffen et al. (2010).

In the Northeast United States and Canada, researchers examined the differences in perceptions of producers, consumers, and organizers of farmers' markets (Smithers & Alun, 2010), which also have potential implications for food producers at large. It is possible to consider farmers' markets small-scale versions of the larger food chain and, in that way, it is possible to extract information from produce growers currently engaged in marketing through farmers' markets about what the levels of transparency in their day-to-day operations are as well as determining what factors influence their decision-making with regard to crop selection, pricing and consumer demands.

By exploring the factors that influence farmers' decision-making and how much influence consumers have upon that decision-making, this study may shed light on the importance of producer behaviors as a foil for current consumer behavior research. An agriculturalist-based perspective on the decision-making factors that influence planting and business decisions may provide a window into a segment of the population that rarely discusses how business decisions are made. By identifying the elements of decision-making, researchers and agricultural professionals can begin to identify how to better communicate to the public what it is that agriculture provides on a large scale. Once the decision-making factors have been identified, the factors can be adapted and expanded to gather information about producers beyond the scope of this study.

The more information researchers can gather from agricultural producers about their annual needs, the easier it will be to communicate that information to consumers through targeted advertising, explanatory dialogues, and public education announcements. Similarly, the more information researchers and agricultural producers

have available about agriculture on the whole, the more successfully messages can be targeted to consumers. By identifying the various aspects of annual planting considerations for farmers in California, this study could be expanded to assess similar habits of agricultural producers in other states as well as provide further insight into the "hows" and "whys" of crop decisions throughout a state, geographical region, or country.

This study focused primarily on growers of annual crops in California and the factors that influenced their decision-making. Exploring the elements of decision-making from the producers' perspective provided a more thorough understanding of the factors producers took into account during their crop selection processes. Ultimately, a better understanding of factors that influence producers' planting decisions may provide more transparency and communication between farmers and the consumers that sustain their businesses. Although a complete understanding of producer and consumer interaction, and the underlying elements is worthy of investigation, that holistic goal is beyond the scope of this study. Therefore, the terminal objective of this study was to develop a framework of the factors producers take into account during their decision-making processes for use in future tests of communications between producers and consumers.

To achieve that terminal objective, this study sought to determine what influenced producer crop selection decisions through phone interviews from a random sample of agricultural producers in California. For purposes of this study, producers were defined as California-based farmers who were currently engaged in the planting

and cultivation of annual crops. Data collected during phone interviews was adapted into an inventory list which was used to assess the rank, in order of importance, of the crop selection influences discovered during discussions with producers. By gathering data related to the factors that influenced crop planting in California, researchers may have an opportunity to better explore ways in which to express those factors to consumers. For instance, a list of typically grown crops in any given region, as well as crops that could be made available due to favorable regional conditions could be created and distributed to consumers through farmers' markets, co-op grocery stores, regional grocers, and other food sales outlets.

Two research questions provided the primary guidance for this study:

RQ1. What factors influence the annual planting decisions of California growers?

RO1.1. Identify and describe factors that influence the annual planting decisions of California growers

RO1.2. Describe how producers rank the factors identified in RO1.1

RQ2. How do consumers influence the annual planting decisions of California growers?

RO2.1. Describe how consumers influence the annual planting decisions of California growers

RO2.2. Describe producers' perceptions of consumer-influence

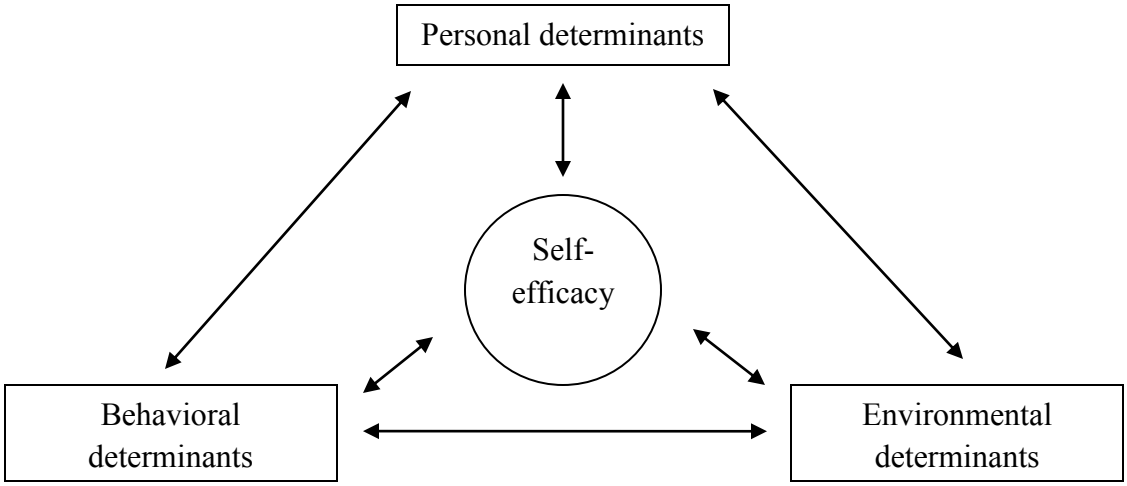
Social cognitive theory

This study was guided by Bandura's (1986) social cognitive theory. Social cognitive theory (Bandura, 1986) informed the research with regard to what influences individuals in their decision-making, behaviors, and pursuits. The factors that influence

individual farmers in their decision-making, general behaviors, and pursuits were, in part, determined through phone interviews. Bandura (1986) introduced social cognitive theory as a way of explaining the interactions between individuals, their behaviors and their environments. Bandura (1986) discussed this triadic relationship as being a cyclical occurrence that people experience time and again throughout the course of their lives.

For purposes of this study, each part of the triad was equally important. In seeking to determine how individuals make decisions and what factors play into those decisions, it was crucial to explore what drove the agriculturalists interviewed as people, how their environment guided the needs for various decisions, and what behaviors impacted their decisions. The major component in all three portions of the triad is self-efficacy, or an individual's belief in their ability to influence events in their lives. Self-efficacy is the characteristic that ties the other three determinants—personal, behavioral, and environmental—together. *Figure 1* uniquely illustrates my interpretation of the integration of self-efficacy into the behavioral determinants triad.

Figure 1.
Social cognitive determinants linked by self-efficacy.



Note. *Bandura (1986) identified personal, environmental, and behavioral determinants as cyclical experiences that shape individuals throughout their lives. This figure illustrates my interpretation of his theory.*

Bandura (1995) noted personal determinants are ever-changing, based on environment. In essence, Bandura (1995) suggested individuals are who they need to be in a given situation. For example, an individual's political views may become less extreme when surrounded by a group of people who are more moderate. To fit into the larger group, an individual could choose to temper their personal beliefs to suit the leanings of the many rather than the few. Differing perspectives based upon setting is directly related to the second part of Bandura's (1995) triad—environmental determinants:

> Any factor that influences choice behavior can profoundly affect the direction of personal development because the social influences operating in the

> environments that are selected continue to promote certain competencies, values, and interests long after decisional determinant has rendered its inaugurating effect. (Bandura, 1995, p. 10)

In terms of this study, an individual involved in agriculture may be more likely to side with the views of other agriculturalists in a group setting while presenting a different perspective in one-on-one discussions. To mitigate the tendency toward moderation in a group, all phone interviews were conducted in a one-on-one setting.

Bandura (1989) also suggested people avoid environments and situations with which they believe they are unable to cope. An additional part of environmental determinants is learning about an environment as one develops and adapting to that environment to suit an individual's needs. As infants grow, they learn about their environments through trial and error, learning what is appropriate for the environment as they develop. Once people have determined their comfort levels in a given environment, they can better function in that environment. Trial-and-error learning as well as comfort with one's environment was crucial to the success of this study as it related to agriculturalists. Farmers are required, by the nature of their pursuits, to be comfortable with their environment individually.

Farmers must negotiate natural obstacles (e.g., weather, topography, and geography), adapt to changes in their crop needs, and run a business with little or no input from other individuals. Despite the occasional group nature of agricultural pursuits, like harvests, it is possible to think of farming as a solitary production effort. The addition of consumers, whether physically present or cognitively present in the form of a

decision-making factor, changes the environment in which farmers function. By keeping consumers in mind, farmers may change their environment to fit the needs they hear from consumers, particularly in a farmers' market, or direct sales, venue. Conversely, if consumers are not a decision-making factor for farmers, they may not make any significant changes to their environment with respect to consumer desires. The solitary nature of agricultural pursuits also impacts a farmer's behavior and, by adding or subtracting consumers into, or out of, that environment, behaviors change.

Behavioral determinants are the third component of Bandura's triad of social cognitive theory. Of the three determinants, behavioral determinants may be the most complicated to explore. Bandura suggested that behavior is determined through modeling (Bandura, 1978) and that "symbolic construction serves as a guide for action" (Bandura, 1978). Symbolic construction, in social settings, are the values individuals, and society, place upon a specific behavior (Heinz & Lee, 1998). In the underpinnings of social cognitive theory, behavior is typically a response to an environment and a learned behavior of what is appropriate in any given setting (Bandura, 1978). Finally, Bandura suggested "the conception of appropriate behavior is gradually constructed from observing the effects of one's actions rather than from the example provided by others" (Bandura, 1978, pp. 139-161); however, introducing negative or positive stimuli does not affect the behaviors of an individual (Bandura, 1978). Baum (1973) suggested that individuals process experiences during long periods of reflection. Baum (1973) further suggested individuals used the conclusions reached during times of reflection to guide their behaviors long-term. For example, farmers may be more likely to maintain a crop

long-term having the opportunity to reflect on the ease of growing the crop, the equipment needed for harvesting, and/or the cost-to-benefit ratio of the crop versus contract payment or sale price. However, it is important to note that individuals are less likely to change their behaviors if they believe their experiences will not change in a given situation (Bandura, 1978). In an agricultural setting, assuming that the behaviors will not change if an individual does not believe a behavioral change will bring about a benefit, it becomes crucial to explore how farmers make decisions about crop planting.

With all three determinants, the key to success or failure may have lain within the context of self-efficacy. The concept of self-efficacy was discussed extensively by Bandura (1986) as it related to the personal, environmental, and behavioral determinants he explored. As the single, consistent link between all three determinants identified by Bandura, it was important to take self-efficacy into account in this study.

Self-efficacy

This study focused on behaviors, characteristics, and decision-making associated with agricultural producers and their planting habits. Hence, the development of variables or test items was, in part, guided by Bandura's theory of self-efficacy (Bandura, 1986). Bandura (1986) defined self-efficacy as being an individual's belief in their own ability to successfully complete tasks. Self-efficacy is believed to influence thought patterns and emotions that drive actions (Bandura, 1986; 1993; 1997). Such characteristics, beliefs, behaviors, knowledge, and techniques could be referenced when describing agricultural producers and their decision-making processes. However, it is

crucial to note that self-efficacy, although part of the study process, was not the major focus of this study.

CHAPTER II

METHODS

This study was a sequential mixed method study (QUAL → quan), as defined by Morse (2003). In sequential mixed designs, "…mixing occurs across chronological phases (QUAL, QUAN) of the study; questions or procedures of one strand emerge from or depend on the previous strand…" (Teddlie & Tashakkori, 2008, p.151). Mixed method developmental studies in the QUAL → QUAN configuration often identify statements or themes through qualitative analysis, followed by statistical analyses (Teddlie & Tashakkori, 2008). This study was heavily guided by the qualitative strand of data collection with limited generalizeable input from the quantitative strand of the research.

Sampling and subject characteristics

A list of California farmers, ranchers, and specialty growers generated by the subscription-based Reference USA was used as the sampling frame for this study. Reference USA, accessible at referenceusa.com, is a database listing information ranging from verified mailing addresses and phone numbers to business types and sizes. Reference USA offers functions to sort through the information it provides based on geography and other factors. To create the list of California farmers, ranchers, and specialty growers, used in both the qualitative and quantitative strands of this study Reference USA parameters for verified business records in California with business descriptors of "farm markets," "farm produce," "farms," "fruits & vegetables-shippers & growers," "general farms-primarily crop," "organic farms," and "vegetable farms" were

used. The initial list of subjects included approximately 3,100 individual businesses. The list was then scrutinized to remove incidental entries that included "farm" or "ranch" in the business listing but did not suit the needs of the study (e.g., wedding venues, fresh grocers markets, etc.). Additionally, the list was analyzed for duplicate entries based on capitalization, address, contact information, or ownership. The final list of subjects included 1,200 potential contacts. The analyzed list of farms was initially in alphabetical order and assigned descending numbers based upon that alphabetization. Once the list of farms and ranches in California was obtained, it was then randomized by number using randomizer.org. Using four groups of randomly assigned numbers generated by randomizer.org, four unique lists of subjects were created. Two lists were used as active sample frames (one for the qualitative strand and one for the quantitative strand) and the remaining two lists were reserved in the event that the first two lists provided no results. This mixed methods study began with qualitative interviews which were assimilated into a quantitative questionnaire.

Qualitative

Qualitative methods are particularly concerned with the "hows" and "whys" of human behavior and the motivating factors that inspire such behaviors. It is important to note that usually qualitative samples are smaller than quantitative samples and are not typically generalized to a larger population. Qualitative methods are particularly useful when exploring the motivations of individuals (Hoshmand, 1989; Polkinghorne, 1991). By conducting interviews with farmers in California, this study may have illuminated motivations—particularly decision-making factors—that farmers may take for granted

but others are not aware of. Qualitative methods offer researchers the opportunity to refine the research process as it progresses. Glaser and Strauss (1967) noted that qualitative research also provides researchers with opportunities to examine themes in interview data to create a theory based upon the information gathered rather than upon a fixed hypothesis. By conducting research with what is in essence a "working theory," researchers may be less concerned with finding "*the* answer" to their specific question and more open to finding "answers" they were unaware of prior to the beginning of the research project. Notably, the potential flexibility of qualitative research may lead to bias as researchers work through a qualitative study.

Identification of major biases inherent in qualitative research at the beginning of any the research process is critical. First, and foremost, researchers must locate their own biases, acknowledge them, and work to set those identified biases aside when gathering data. Self-location, both in terms of a researcher's biases as well as a recording of the researcher's thoughts, feelings, reactions, and so forth, throughout the qualitative research process is critical to ensuring that a researcher maintains as much distance as possible from their research subjects. Qualitative researchers, including Lincoln and Guba (1985), argued it is impossible for any researcher to be a "blank slate" or completely objective observer. By self-locating, a researcher is acknowledging they have subjectivity while conducting their research. Additionally, expressing ownership of their impressions, familiarities, and reactions to specific situations allows researchers to more carefully examine the information they gather in interviews and through participant observation without fear of contaminating the data collected.

Trustworthiness

It is essential for qualitative research to be trustworthy. Trustworthiness is multidimensional and established through a number of avenues, including detailed articulation of procedures, evidence of enough data quantity and quality, identification of themes that address the richness of the data, and evidence of identified themes fitting well with the collected data (Williams & Morrow, 2009). Lincoln and Guba (1985) defined trustworthiness as requiring researchers to ask themselves four questions to determine the validity of their sources:

> (1) *"Truth value"*: How can one establish confidence in the "truth" of the findings of a particular inquiry for the subjects (respondents) with which and the context in which the inquiry was carried out?
>
> (2) *Applicability*: How can one determine the extent to which the findings of a particular inquiry have applicability in other contexts or with other subjects (respondents)?
>
> (3) *Consistency*: How can one determine whether the findings of an inquiry would be repeated if the inquiry were replicated with the same (or similar) subjects (respondents) in the same (or similar) context?
>
> (4) *Neutrality*: How can one establish the degree to which the findings of an inquiry are determined by the subjects (respondents) and conditions of the inquiry and not by the biases, motivations, interests, or perspectives of the inquirer? (Lincoln & Guba, 1985, p. 290)

Lincoln and Guba (1985) go on to discuss, at length, what constitutes the answers to the four questions they suggest researchers pose to themselves as being internal validity, external validity, reliability and objectivity (p. 290).

Truth value, or internal validity, is described as "the extent to which variation in an outcome (dependent) variable can be attributed to controlled variation in an independent variable" (Lincoln & Guba, 1985). Additionally, Lincoln and Guba noted that a causal connection between the variables is generally assumed. Campbell and Stanley (1963) noted there are eight possible "threats" to internal validity including history, maturation, testing, instrumentation, statistical regression, differential selection, experimental mortality, and selection-maturation interaction. Truth value, in terms of this study, was determined through triangulation. By interviewing several informants with differing perspectives on California-based agriculture, I was able to establish that answers generally remained consistent throughout the qualitative strand of the study.

Applicability, or external validity, was defined by Cook and Campbell (1979, p. 37) as "the approximate validity with which we infer that the presumed causal relationship can be generalized to and across alternate measures of the cause and effect and across different types of persons, settings, and times." Lincoln and Guba (1985) noted that "every element of the population has a known probability (not necessarily equal) of being included in the sample, then it is possible to assert, within given confidence limits, that the findings from the sample will hold for (be generalizable to) the population" (p. 291). Just as there are threats to internal validity in research, LeCompte and Goetz (1982) noted there are similar threats to external validity

including: selection effects, setting effects, history effects and construct effects. Applicability was addressed in this study, again, with the help of triangulation.

Consistency, or reliability, "is not prized for its own sake but as a precondition for validity; an unreliable measure cannot be valid" (Lincoln & Guba, 1985). Reliability is typically tested through replication of a study or through a parallel construction. Threats to reliability are "any careless act in the measurement or assessment process, by instrument decay, by assessments that are insufficiently long (or intense), by ambiguities of various sorts, and a host of other factors" (Lincoln & Guba, 1985). Consistency was difficult to address during the course of this study largely because it was not duplicated.

Neutrality, or objectivity, is possibly the most difficult to achieve in a qualitative study. Lincoln and Guba (1985) suggested that to reach neutrality multiple observers should "agree on a phenomenon" which makes their "collective judgment" objective. "Objectivity is threatened, then, by using imperfect methodologies that make it possible for inquirer values to refract the 'natural' data—putting questions not directly to 'Nature Itself' but through an intervening medium that 'bends' the response" (Lincoln & Guba, 1985, p. 293). Neutrality was achieved in this study through the use of self-location and informal journaling to mitigate my personal biases.

Self-location

By acknowledging that their physical presence alone may change the dynamic of the individuals observed and interviewed, researchers can only report what they observed in that specific instance rather than suggesting that the behaviors and responses of their subjects would not be changed if the researcher was not present. Additionally,

self-location offers researchers an opportunity to identify their own biases before, during, and after data collection. Personally held beliefs, previous experiences, and/or other "baggage" may color the perceptions and responses of the researcher during the course of data collection. Conscious avoidance of changing data to suit the researchers' point of view is the cornerstone of self-location strategies. In addition to self-location, data saturation offered an opportunity to off-set researcher bias.

Data saturation

Establishing trustworthiness through gathering "enough" data is a topic of some flexibility. Qualitative research focuses on the idiom of "data saturation" or the point at which several different subjects provide the same answers or when new answers cease emerging in data collection. Unlike quantitative data collection, which bases "enough" data upon a statistical analysis, qualitative data collection begins and ends when the researcher deems the information gathered is sufficient to guide the study and/or provides the insight necessary to complete the research. "In practice, the number of required subjects usually becomes obvious as the study progresses, as new categories, themes or explanations stop emerging from the data (data saturation)," (Martin, 1996). There is no pre-determined time frame or targeted number of responses needed at the outset of data collection but rather there is a benchmark for information collected set by the researcher during the course of data collection. Additionally, Morse (1995) suggested that "saturation is the key to excellent qualitative work" but the same work noted, "there are no published guidelines or tests of adequacy for estimating the sample size required to reach saturation." This study garnered 15 interviews out of 300 calls. Statistically

speaking, a 5% response rate is unacceptable. However, because there does not appear to be any published guidelines about what an acceptable response rate is in qualitative research, the 5% response rate was deemed acceptable based upon data saturation.

Identification of themes

Identifying themes that emerge as data is collected add to the trustworthiness of the data. During the course of data collection, themes may emerge and change, giving further understanding and guidance to the study being conducted (Denzin, 1970; 1978; 1989; 1997). By analyzing informant responses and interview transcripts for themes, researchers may be better able to employ their findings in either further qualitative study or in a quantitative strand of a mixed methods study. Additionally, being able to connect themes to the data collected, lends credence to the study and researcher. If a researcher conducts several interviews and discovers no emerging themes that are related to the topic of the study, the researcher has an opportunity to adjust their questions or approaches as needed (Denzin, 1970; 1978; 1989; 1997).

In relation to this study, self-location and trustworthiness are of paramount importance. My biases—in the form of life experiences and long-held beliefs—provided a perceived familiarity with the subject matter: planting decision-making. As a third-generation farmer from Washington state, I began this study believing my world view of farming was sufficiently broad to provide a good knowledge base with which to inform my research choices. As the qualitative portion of this study began to take shape, it became increasingly clear that my knowledge of farming practices and vocabulary was limited to the crops, habits, and vernacular of the Pacific Northwest. Additionally, that

previous knowledge was not transferrable to my interviews with producers in California. Because of that observation, I chose to distance myself from my experiences and beliefs as much as possible in each interview as it became apparent that concerns, crops, habits, and growing seasons in California differed from my experience as a third-generation farmer from Washington state. During the course of the study, my personal definition of farming began to expand to encompass a broader idea of what it means to participate in agriculture with each successive interview. Further, I maintained an informal journal chronicling my own concerns, reactions, and questions about my own knowledge as highlighted after each subsequent interview with California-based agricultural producers. Among the questions that emerged for me personally was the basic question: What is the definition of farming? My construction of farming differed from the answers gathered through telephone interviews for this study and, ultimately, led to a change in my perception of farming in a holistic sense. By recording my internal responses to informants, I worked to provide as much of an intellectual and emotional barrier as possible.

Data collection

I conducted interviews in various locations including a home office, the front porch of my home and, in one instance, in a vehicle. All interviews were conducted via cellphone call and lasted approximately 15 minutes. Each phone call interview was slightly different in its tone and the introductory approach; however, each phone interview included a basic introduction of who I was, why I was calling, and a request for verbal consent to be interviewed from the agriculturalist who answered the call.

Phone calls were made during various times of day including mid-morning (between 9:30 and 11:30 a.m.), early afternoon (between 1 and 2:30 p.m.), and in early evening (between 4:30 and 6:30 p.m.). Early afternoon garnered the best success in getting a phone call answer. Despite the relative success of early afternoon phone calls, the majority of phone calls ended in messages left in electronic voicemail boxes, on answering machines, or with other members of the producer's household. Voice messages left for producers included their first and last name (when available), the reason for the call, and my name and contact information. Messages left with members of the household included the reason for the call, and my name and contact information. In total, 300 phone calls were made during a 10-week period between July and September 2013. Of the 300 phone calls made to farmers in California, 15 interviews resulted. At the conclusion of each successful phone interview, informants were asked if they could be contacted further regarding the study. All 15 informants consented to be contacted again should the need have arisen. All interviews were transcribed either by hand in a notebook on a new, blank page during the interview or typed into a new Word document on my personal computer. By transcribing each interview on a new sheet of notebook paper or in a new Microsoft Word document on a personal computer, I was able to isolate the responses of each individual producer rather than relying on information provided in a previous interview to guide the subsequent interview.

After two interviews had been successfully completed, I began to analyze the responses of the informants contacted. A content analysis of the interview transcripts was focused on discovering recurring words and phrases, or "themes," discussed by each

informant independently. To avoid cross-contamination or leading questions, each interview was done without benefit of transcripts from previous interviews. Analysis of the interview transcripts highlighted a series of similar responses and conclusions from informants. As interviews beyond the initial two were conducted, the similarity of responses continued to emerge and be strengthened by those subsequent interviews. As addressed earlier, the 5% response rate (15 interviews out of 300 phone calls) was sufficient based on data saturation to move forward with the study. Data saturation, in terms of overlapping responses, was reached within five interviews and further confirmed by the additional interviews.

After interviews with informants had been concluded, the themes and information discovered during those interviews was then used to help guide interviews with soil and irrigation specialists and farm bureau directors in California. Soil and irrigation specialists were identified through the California extension service and contacted based upon identified research interests in their respective personal profiles. One California farm bureau director was recommended as an informant for this study. That farm bureau director provided the names of other farm bureau directors in California that she believed would be able to provide insight into the farming decisions being made throughout the state. In all, six interviews with specialists and farm bureau directors were conducted upon conclusion of producer interviews. The soil and irrigation specialists and farm bureau directors were presented with the thematic responses given by farmers in California and asked if they agreed or disagreed with the responses. From interviews conducted with all informants, a list of recurring phrases regarding annual

planting decisions were identified as the major factors that determine crop selections for California farmers. The major factors identified by informants as being crucial to annual crop selections included:

- Soil quality,
- water availability,
- market demand,
- contract availability,
- crop expertise, and
- necessary equipment.

California farm bureau directors and soil and irrigation specialists confirmed that the factors identified in interviews with farmers were the same concerns brought up to, and with, farm bureau employees and soil and irrigation specialists.

Specialists and farm bureau directors were further asked if they had anything to add to the responses given by California crop producers. The specialists and farm bureau directors agreed with the data collected from the California producers and added they believed regulatory issues were a concern for farmers in California. Phone interviews with soil and irrigation specialists and farm bureau directors were conducted in the late afternoon, Central Standard Time, to mitigate the two-hour time difference between California (Pacific Standard Time) and Texas (Central Standard Time). Each interview was conducted via cellphone and conducted either in my office on the Texas A&M University campus or in the office at my home. All interviews were transcribed in new

Microsoft Word documents on either my university issued computer or on my personal computer. Interviews with farm bureau directors were slightly longer than producer interviews and ranged in topics from the basic request for agreement or disagreement about previously collected data to information about the most widely grown crops in the county where the bureau operated. Similarly, the interviews with soil and irrigation specialists were conducted with use of my cellphone in my on-campus office. The specialist interviews were longer as they required more detailed explanations regarding soils and irrigation in California, as well as discussion about how soil condition and irrigation choices impacted both production and producers.

Once data had been fully evaluated for both recurring themes and possible overlapping with social cognitive theory (Bandura, 1986), the data were translated into information that helped to guide the development of a survey instrument for the quantitative strand of this study. The survey instrument was developed to determine the accuracy of information provided by the informants interviewed in the qualitative strand of the study. In addition to collecting more data confirming the information collected in the qualitative strand of this study, the survey instrument asked respondents to rank, in order of importance (1 = least important, 5 = most important), the factors identified by the qualitative strand informants.

In addition to confirming the validity of the decision-making factors identified in the qualitative strand of this study, the interviews with informants provided several perspectives on the same topic. Informants who were all engaged in production agriculture in various capacities had points of view that offered a more holistic picture of

the agricultural system in California. By triangulating the three perspectives, I was able to test the validity and reliability of the responses from each group.

Triangulation

The roots of triangulation are firmly planted in endeavors to replace the ideas of "validity" and "reliability" in qualitative research. Campbell and Fiske (1959) championed the notion of "methodological triangulation" in an effort to suggest that by researching a single topic through multiple perspectives, the investigation is building internal validity and reliability. Several researchers continued to explore the ideas of Campbell and Fiske but their suggestion of "methodological triangulation" was not truly popularized until Denzin (1970, 1978, 1989) published a textbook endorsing the proposed research method and expanding upon the initial intention of Campbell and Fiske (1959). Other researchers, Hammersley and Atkinson (1983), described triangulation as "links between concepts and indicators are checked by recourse to other indicators" (p. 199). In relation to this study, conducting interviews with multiple informants, and gathering interpretations of decision-making factors from those informants, provided a perspective triangulation. While agricultural producers, farm bureau directors and agricultural specialists were all involved in production agriculture in California, all three groups approached the same topic from different perspectives. The differences in perspectives of each group provided a fuller, holistic description of the factors that ultimately guide the decisions of California-based agriculturalists.

Social cognitive theory

Analyses of data collected from all three informant groups—California-based farmers, farm bureau directors, and agricultural specialists—also included social cognitive theory (Bandura, 1986) considerations. Bandura (1986) suggested that a triad of determinants—personal, behavioral and environmental—guides all human behavior. A case could be made that the majority of California-based agriculturalists interviewed for the qualitative strand of this study were guided largely by environmental determinants in the form of market demand, contract availability, water availability, and soil quality. However, it is also important to note that personal determinants and self-efficacy were essential to crop expertise and the producers' belief in their ability to complete the work needed to plant and raise a crop through its life cycle. Although self-efficacy, in particular, was not a key component of this study, it was understood that agriculturalists who consented to participate in this study through phone interviews had a belief in their own abilities as farmers to complete all the tasks necessary to fulfill their contractual obligations to plant, grow and harvest any given crop.

A priori research

Assumptions regarding the nature of informants were made *a priori* during this study. In some instances those assumptions appeared to be correct—that there were farmers in California and that their concerns were varied based upon geography, size of farm, and performance expectations. In other instances, assumptions about the nature of farming and agriculture were challenged by the information gathered in interviews. For instance, it was discovered that something as simple as the term "farming" has as many

definitions, connotations and personally derived explanations as there are farmers. In some instances "farming" related to a farmer's experiences but other farmers discussed "farming" with a business-like detachment that had nothing to do with the assumed personal attachment to the activity.

Because there was little pre-existing research related to the focus of this study, it was difficult to conduct interviews without some *a priori* guidance. Making some assumptions about the people being interviewed was unavoidable when formulating interview questions ranging from information on how long informants had been participating in agriculture to their basic knowledge of the benefits and drawbacks of living in their specific region. By choosing to make *a priori* leaps regarding self-efficacy and individual knowledge, opportunities were created to learn more about the informants rather than less in this instance. By assuming informants were experts on their own crops, region and preferences, informants were, in turn, more willing to discuss the details of their particular farms and operations during the qualitative strand of this study.

Self-efficacy

Self-efficacy, or the belief in one's own ability to complete tasks and reach goals, is a major contributing component to social cognitive theory (Bandura, 1986). The development of variables or test items was, in part, guided by Bandura's theory of self-efficacy (Bandura, 1986). Self-efficacy is believed to influence thought patterns and emotions that drive actions (Bandura, 1986; 1993; 1997). Such characteristics, beliefs, behaviors, knowledge, and techniques could be referenced when describing agricultural producers and their decision-making processes. As a crucial component of social

cognitive theory (Bandura, 1986), it was important to note that although self-efficacy exists in the theoretical underpinning of this study, it is beyond the scope of this study with regard to data collection. However, assumptions were made regarding the self-efficacy of farmers interviewed during the qualitative strand of this study. Agriculturalists consistently make decisions related to task completion and goal fulfillment and thus it was assumed, for purposes of this study, that the farmers interviewed were aware of their abilities with regard to self-efficacy.

Interview informants

During the course of conducting interviews and evaluating responses, it became apparent that agriculturalists who participated in interviews for this study fell on polar ends of the agricultural spectrum. Some of the producers were business-like, or were driven by a combination of business acumen and a desire to survive, in their approaches to agriculture—thinking in terms of a business and their family life associated with the business—whereas, others were less concerned with the business aspects of agriculture and more interested in "serving the common good." These polar informants prompted me to create personas to provide further insight into the individuals who, ultimately, helped to create the survey instrument developed to carry out the quantitative strand of this study. McGinn and Kotamraju (2008) described creating personas as a cost-effective and efficient way to "create user profiles." They noted the problems with persona development included lack of believability, lack of connection between the persona and the data, and lack of time and money to conduct an adequate number of interviews to gather enough data for believable personas. Developing personas for this study involved

numerous interviews that were directly connected to the data collected. Time and funding were not significant drawbacks in this study. One can always wish for more time and money to make a study better but I believe the time spent interviewing participants was adequate to provide clear guidance for the development of the included personas.

"Steve the Hobby Farmer," a retired technology guru turned farmer for his health and the health of the planet, and "Kevin the Legacy Farmer," a third-generation farmer concerned about getting by financially and influencing his children to pursue careers in agriculture were the personas that emerged through content analysis of the qualitative data collected. Additional character sketches to better describe the farm bureau directors and agricultural specialists who participated in the qualitative strand of the study were also created. "Morgan the Socialite," the farm bureau director, provided a great deal of insight into the workings of agriculture-related business in her county but was somewhat disconnected from the ebbs and flows of the markets and other pressures facing farmers. Similarly, "Tom the Professor," the agricultural specialist, was an expert in his particular area of study but was less concerned with the real-farm-world implications of that area of study.

Interviews of informants with several perspectives related to farming in California provided the backbone for the qualitative strand of this study. The informants came from various walks of life but all participated in a portion of production agriculture. After conducting a content analysis of their interview responses, personas were created based upon the data collected to provide a better understanding of the study

informants. Additionally, the data collected from the interviews was assimilated into a survey instrument for the quantitative strand of this study.

Quantitative

Quantitative methods are typically aimed at more empirical forms of study, venturing to explore questions through the use of specifically tailored methods. Quantitative methods in social sciences often involve the development of a questionnaire instrument to generate statistical information free from bias, thus, giving researchers replicable information from a pool of informants. Because the terminal objective of this study was to develop a framework of the factors producers take into account during their decision-making processes, additional theories provided methods guidance for this study, including classical test theory, psychometric theory, and social cognitive theory.

Classical test theory

The qualitative strand of the study was approached from a rank-order perspective, rather than an individual item basis. In his explanation of classical test theory, DeVellis (2006) noted, "fundamentally, [classical test theory] concerns using observable information (such as scores on questionnaire items) to garner insights into variables (such as patient satisfaction) that cannot be directly observed." Thus, the procedural approach associated with classical test theory (DeVellis, 2006)—which can also be traced back to Spearman (1904), Guttman (1945), Cronbach (1951), and Nunnally (1967)—guided the methods and analyses.

Most of the conceptual and theoretical underpinning of scale development can be traced back to Spearman (1904a; 1904b; lead to classical test theory and Spearman's G),

whose work provided a basis for Guttman (1945; relationship between items in a test), Cronbach (1951; Cronbach's alpha and subsequently generalizability theory), and Nunnally (1967; psychometric theory).

Validity and reliability

Two concepts are important to consider when conducting survey research: validity and reliability (Fraenkel & Wallen, 2009). Validity is the degree to which correct inferences can be made based on the results from an instrument (Bryman, 2012; Fraenkel & Wallen, 2009). Cresswell (2013) noted, validity is related to "whether one can draw meaningful and useful inferences from scores on the instruments" (p. 160). Cresswell (2013) additionally noted there are generally three types of validity presented in quantitative research: "(a) content validity (do these items measure the content they were intended to measure?), (b) predictive or concurrent validity (do scores predict a criterion measure? Do results correlate with other results?), and (c) construct validity (do items measure hypothetical constructs or concepts?)" (p. 160). This study was particularly focused upon construct validity, or whether or not the instrument measured hypothetical concepts. As there was little previous research related to the topic of this study, development of an instrument with the results of the qualitative strand of this study became the primary focus of the quantitative strand of the study. Additionally, the administration of the survey instrument developed specifically for use with this study could be construed as a piloting of an instrument to be potentially used in further studies of a similar subject. The face validity of the instrument was assessed by Texas A&M University research faculty in the Department of Agricultural Leadership, Education and

Communications. After the instrument was evaluated by research faculty at Texas A&M University, it was also sent to the four farm bureau directors who were interviewed during the qualitative strand of this study for further evaluation. All four bureau directors assessed the content validity of the instrument by reviewing the instrument and assessing whether the instrument included decision-making factors with which the farm bureau directors were familiar. All four farm bureau directors independently concurred that the instrument included the decision-making factors that guide California farmers in their annual planting decisions.

Reliability is the degree to which scores obtained with an instrument are consistent measures of whatever the instrument measures (Bryman, 2012; Fraenkel & Wallen, 2009). Cresswell (2013) noted that reliability of instruments is demonstrated with repeated use of an instrument over time. Repeated use of an instrument with continued, similar results implies the instrument is reliably measuring what it is meant to measure. However, because the instrument employed in this study was developed specifically for this study, it was difficult to measure reliability. If the instrument is employed in similar future studies, the reliability of the instrument can be established over time.

Instrumentation

A two-section survey instrument was created using items identified in the qualitative strand of this study. The first section of the instrument included questions related to the factors agriculturalists weigh when making annual crop planting decisions. In the first section, instrument respondents were asked to rank in order of importance

(from greatest [5] to least [1]) the factors listed in each question. The second section of the instrument included demographic questions aimed at identifying the location of the farm(s) owned/operated by the respondent as well as identifying the crops they tend to grow.

Items included in the first section of the instrument were developed using the factors discovered in the qualitative strand of this study including soil quality, water availability, market demand, contract availability, and crop expertise. Additionally, experts in soil sciences, irrigation, farm bureau operations, and agricultural advocacy were asked to provide information about the accuracy of the factors and what, specifically, was evaluated when looking at each factor individually. For purposes of this study, it was paramount to keep the survey instrument as concise as possible. The instrument developed was 10 questions with a total of 26 considerations.

Instrument development

DeVellis (2012) noted that scale development should begin with an over-inclusion of items to provide as much opportunity as possible for each item to be evaluated. The "pool of items should be a rich source from which a scale can emerge," (DeVellis 2012, p. 84). The "rich source" for the development of the instrument used in this study was the qualitative strand of the study, which provided numerous examples of the decision-making factors that interviewed farmers must weigh when determining what crops to plant. DeVellis (2012) suggested researchers should begin by creating their own pool or list of items after reviewing the literature. However, in the case of this

study, there was little literature to draw upon, thus the use of the qualitative strand of the study, in some ways, supplanted the review of pre-existing literature on the topic.

While developing the instrument employed for this study, it was also important to consider the most appropriate response format (DeVellis, 2012). Thurstone (1928), Likert (1932), and Guttman (1950) scales were all considered when determining the most appropriate response format. The Thurstone (1928) scale was not well suited for this study because the Thurston's format most commonly requires items to be "precalibrated with respect to their sensitivity to specific levels of the phenomenon" (DeVellis, 2012, p. 86). The Likert (1932) format was not considered appropriate because the goal of the study was to determine the order of importance of the identified factors. The Guttman (1950) scale was considered to be the most appropriate response format for this study because Guttman's format is commonly used to establish a hierarchical pattern of responses (DeVellis, 2012).

The visual design of the instrument was simple; employing two colors throughout the body of the instrument and using "Century Gothic" as the font of choice to keep the instrument as visually appealing as possible. As suggested by Dillman (2008), the instrument included clear, concise instructions regarding completion of the instrument, a concise list of questions and a short list of demographic inquiries. The instrument was printed on a standard 8-by-11.5-inch sheet of printer paper in full color front-and-back (see Appendix A).

Other materials for administration of the instrument included a pre-notice postcard printed on standard cardstock in a matte finish. The front of the postcard

included an image of the Central Valley in California (see Appendix B). The back of the postcard provided notice to California farmers that they had been selected for inclusion in this study, a shortened URL to an online version of the survey maintained through Qualtrics, and a request for their cooperation in completing the survey instrument either online or via the paper copy that would be forthcoming.

A thank you/reminder postcard (see Appendix C) was developed with the same image on the front of the postcard as was used on the pre-notice postcard. The information on the back of the thank you/reminder postcard thanked participants who had already completed the survey instrument and returned it via the provided business reply envelopes and served as a reminder for participants who had yet to respond.

Mailing followed the schedule suggested in *Internet, Mail and Mixed-Mode Surveys: The Tailored Design Method* (Dillman, et al., 2008). Dillman (2008) suggested a five-contact approach to data collection and this study followed that approach (*Table 1*). An additional set of interviews and survey mailing were conducted to gather additional responses.

Table 1.
Summary of contact attempts and methods

Contact	Invited *n*	Completed *n*	Contact Methods	Date Range
Interview	300	15	Phone Call	07/2013 – 09/2013
Survey Pre-notice	200	0	U.S. Postal Service	10/24/2013
First Survey	200	35	First Class with Business Reply Envelopes	10/31/2013
Survey Reminder/Thank You	200	0	U.S. Postal Service	11/08/2013
Second Survey (Non-respondents)	165	23	First Class with Business Reply Envelopes	11/16/2013
Final Survey (Non-respondents)	142	0	First Class with Business Reply Envelopes	11/30/2013
Follow-up Interview with Survey Respondents	33	10	Phone call	01/13/2014 – 01/17/2014
Survey Pre-notice	10	0	U.S. Postal Service	02/03/2014 – 02/05/2014
Survey Mailing	10	0	First Class with Business Reply Envelopes	01/27/2014

Note. The mailing schedule and follow-up efforts followed the methods suggested in Internet, Mail and Mixed-Mode Surveys: The Tailored Design Method (Dillman, et al., 2008).

The instrument packets included copies of the instrument, a cover letter explaining the purpose of the study and the importance of the responses to the study, a business reply envelope and a $1 bill. Instrument packets were mailed with hand-applied address labels and First Class postage stamps.

In total, 210 subjects were invited to participate in this study. Of the 210 subjects invited, 58 completed and returned the survey instrument. Of the completed and returned

instruments, 30 provided information pertinent to the study. Each of the respondents who provided usable responses was contacted via cell phone call and thanked for their participation in the study. Additionally, each respondent was asked if they could provide information about another agricultural producer, similar to themselves, that could be asked to participate in the study. The majority of producers declined to provide additional names but two provided five producer names each.

The 10 additional producers were contacted via cellphone call and invited to participate in the study. I was unable to reach any of the producers but was able to leave voicemail messages for each of them. After leaving messages for each producer, a survey packet, identical to the packets sent to the initial sample frame, were prepared and mailed via U.S. Postal Service. The final response rate for the quantitative strand of the study was 27.6% (58 responses out of 210 instruments mailed). Of the 27.6% of participants who responded, 30 respondents, or 52%, of the responses included completed questionnaires. The 27.6% response rate limits the generalizability this study. To provide statistically significant results, the questionnaire response rate should have exceeded at least 30%, preferably 70%. Therefore, the results must be restricted to the individuals who participated in the study.

Subject characteristics

Survey respondents were of various ages and had varying amounts of acreage they reported farming. A series of demographics questions were included at the end of the questionnaire. The goal of the demographics questions was to explore the average age of survey respondents, as well as measure the number of acres study participants

were managing. The ages of survey respondents included in this study ranged between 35 and 81 years-of-age (n = 28), which, on average (M = 60.07 years; SD = 9.98), was slightly greater than the average reported by the National Agricultural Statistics Service in the recently released USDA 2012 Farm Census (M = 58.3 nationally; SD was not reported in the Farm Census). Additionally, the average number of acres farmed by survey respondents (M = 1,670.7; SD = 2,388.7) was higher than the national average reported in the 2012 Farm Census (M = 434; SD was not reported in the Farm Census).

The most telling demographic data was collected in the number of years that survey respondents had been farming. The average number of years spent farming was 32.18. The indication that survey respondents had been farming more than 30 years, may suggest that making assumptions about the self-efficacy of participants was not misguided. The average age of survey respondents, coupled with the length of time they had spent farming, suggests longevity and success in their farming operations.

In addition to reporting their ages, survey respondents were asked to indicate the number of acres they were farming at the time the survey was administered. Survey respondents indicated that the number of acres they farmed ranged from zero to 10,000 (M = 1,670.70; SD = 2,388.72) as illustrated in *Table 2*. The mean reported number of acres farmed by survey respondents is considerably larger than the average reported by the 2012 Farm Census (M = 434 nationally; SD was not reported in the Farm Census).

Table 2.
Acres farmed by survey respondents. (n = 27)

Acres farmed	*f*	%
0	2	7.4
5	1	3.7
20	1	3.7
40	2	7.4
200	3	11.1
300	1	3.7
400	1	3.7
450	1	3.7
605	1	3.7
619	1	3.7
1,000	1	3.7
1,180	1	3.7
1,200	1	3.7
1,300	1	3.7
1,500	2	7.4
2,000	1	3.7
2,850	1	3.7
3,500	1	3.7
4,000	1	3.7
6,000	2	7.4
10,000	1	3.7
Total	30	100.0

Note. *n = 27. The average acres farmed was 1,670.70 and the SD = 2,388.72 but the most frequently occurring number of acres farmed was 200.*

The most frequently occurring number of acres farmed by survey respondents was 200 (*n* = 3). The next most frequently occurring number of acres farmed by survey respondents were 0, 40, 1,500, and 6,000 acres (*n* = 2 each). The varied amounts of acres reportedly farmed by survey respondents suggested that the study reached farmers in a great number of agricultural pursuits and levels of land investment.

The mean number of acres farmed by survey respondents was 1,670.70, a far larger number of acres than the average acres (*M* = 556.96; *SD* = 745.91) reportedly owned by survey respondents (*Table 3*). The discrepancy suggested that California-

based farmers invested time and effort into farming and/or managing acres not under their ownership. However, the maximum number of acres owned by survey respondents was 3,250 acres and the minimum number of acres owned by survey respondents was zero. The standard deviation of 745.91 acres suggested that land ownership among survey respondents was extremely stratified.

Table 3.
Acres owned by survey respondents.

Acres owned	*f*	%
0	3	11.1
5	1	3.7
15	1	3.7
30	1	3.7
40	1	3.7
45	2	7.4
80	1	3.7
130	1	3.7
132	1	3.7
200	2	7.4
320	1	3.7
450	1	3.7
500	2	7.4
760	1	3.7
780	1	3.7
1,000	1	3.7
1,137	1	3.7
1,180	1	3.7
1,475	1	3.7
1,500	1	3.7
1,534	1	3.7
3,250	1	3.7
Total	27	100.0

Note. *n = 27. The most frequently occurring number of acres reportedly owned by survey respondents was zero (n = 3).*

By collecting data related specifically to the number of acres owned by survey respondents (*Table 4*), it was determined that this survey could have the potential to explore the culture of farming in California. The most frequently reported number of acres owned by survey respondents was zero ($n = 3$) while the next most frequently reported number of acres owned were 45, 200, and 500 ($n = 2$ each). Based upon the information collected, one might conclude that most of the acres farmed by survey respondents were not owned by them. The standard deviation ($SD = 2{,}221.5$) of the number of acres reportedly leased by survey respondents was nearly twice the mean ($M = 1{,}173.9$), which suggested there were some disparities in farm size when evaluated alongside the number of acres reportedly farmed and owned by survey respondents.

Table 4.
Number of acres leased by survey respondents.

Acres leased	*f*	%
0	5	21.7
7	1	4.3
40	1	4.3
55	1	4.3
65	1	4.3
105	1	4.3
200	2	8.7
250	1	4.3
489	1	4.3
700	1	4.3
850	1	4.3
863	1	4.3
970	1	4.3
1,180	1	4.3
1,525	1	4.3
5,000	1	4.3
6,000	1	4.3
8,500	1	4.3
Total	23	100.0

Note. *n = 23. The most frequently reported number of acres leased by survey respondents was zero.*

The number of acres reportedly leased by survey respondents could suggest the culture of farming in California lent itself to a leased, rather than owned, land basis. The most frequently reported number of acres leased by survey respondents was zero acres; however, the maximum of 8,500 acres could suggest that land ownership is not necessarily a primary concern for California-based agriculturalists who participated in this study. The maximum number of reported acres farmed was 10,000. If a farmer is leasing 85% of his or her acres during the course of the year, the next question becomes one of management and decision-making. An agriculturalist faced with a significant leasing fee will have to weigh which crops are most profitable year-to-year as well as

determining the most effective farming practices to get the maximum yield out of each acre.

The maximum number of years reportedly spent farming by survey respondents was 56 (*Table 5*); whereas, the minimum number of years reportedly spent farming by survey respondents was eight ($M = 32.18$; $SD = 11.86$). The number of years spent farming by survey respondents was an important factor to determine for purposes of this study because it related directly to the self-efficacy of the respondents.

Table 5.
Number of years spent farming by survey respondents.

Number of years spent farming	*f*	%
8	1	3.6
10	1	3.6
14	1	3.6
18	1	3.6
21	1	3.6
22	1	3.6
23	1	3.6
24	1	3.6
25	1	3.6
28	1	3.6
30	2	7.1
33	2	7.1
34	1	3.6
35	2	7.1
36	1	3.6
39	1	3.6
40	2	7.1
41	1	3.6
42	1	3.6
44	1	3.6
45	2	7.1
50	1	3.6
56	1	3.6
Total	28	100.0

Note. *n = 28. Number of years spent farming was reasonably distributed with the most frequently reported number of years being 30, 33, 35, 40, and 45 (n = 2 each).*

Bandura (1986; 1993; 1997) devoted a great deal of time to self-efficacy and its place within social cognitive theory as a whole. This study made *a priori* assumptions about the level of self-efficacy of the study participants. By seeking a self-reporting of the number of years survey respondents had spent farming, I was able to substantiate the *a priori* assumptions made about the self-efficacy of the farmers who participated in this study. The minimum number of years reportedly spent farming by survey respondents was eight years. The maximum number of years reportedly spent farming by survey

respondents was 56 years. The mean number years reportedly spent farming was 32 years. There were very few instances of "frequent" number of years spent farming reported by survey respondents with 30, 33, 35, 40, and 45 years being reported twice each. The wide swath of reported number of years spent farming suggested that survey respondents were at least somewhat successful in their chosen occupation and, thus, had a high level of self-efficacy.

CHAPTER III

RESULTS

Qualitative

Interviews provided the basis for the qualitative strand of this mixed methods sequential study (QUAL → quan). A series of interviews were conducted with numerous crop producers throughout California as well as with representatives from four farm bureaus and experts in the fields of irrigation and soil science. Interviews yielded wide-ranging comments, concerns and considerations that influenced how crop producers in California approach their annual planting decisions.

Archetypal farmers

It is important to note that each group of interviews yielded "types" of individuals that were somewhat polar in their approaches to agriculture as well as their approaches to decision-making with regard to annual planting decisions. McGinn and Kotamraju (2008) described creating personas as a way to present concise descriptions of groups of study participants. To create personas for their study, McGinn and Kotamraju (2008) distributed a survey to measure training experiences among employees of an organization. The personas for this study were developed after conducting a series of phone interviews with farmers to better understand the factors they weigh when making annual crop decisions. The phone interviews included questions about their motivations, previous and current experiences, cursory personal histories and various other topics as developed naturally through conversations in semi-

structured interviews. Farmers interviewed gave the impression of belonging to one of two archetypal farmer personas.

The first archetypal farmer, "Steve the Hobby Farmer," emerged via interviews with agriculturalists whose primary business plan was one focused on a small, specialized market (*Table 6*). Steve emerged as having a strong point of view about his chosen profession. "Nettle demand has gone up in the juicing CSA we sell to," one grower noted. Another farmer who contributed to the development of the Steve persona noted the health benefits of their crops. "Our biggest crop is kale in the Bay Area. It's high in nutrients; it's good for you." A study participant who also fell into the Steve category noted the trendiness of some of their crops. "We're growing things they have in Mexico or China that no one is eating here. That's something to slowly raise up behind the other crops because it creates an exclusivity and then people come to you."

Table 6.
Summary of the Steve the Hobby Farmer persona.

Archetype Name	Steve the Hobby Farmer
Demographics	Male Mid-40s White Semi-Urban area (e.g., just outside a major city)
Background	Owner-operator of a small, five to 10-acre specialty crop farm. He relocated from an urban area wanting to slow down and change his lifestyle, including his eating habits, and could not find the specialty items he wanted. So he began a small farm to suit his food needs. The farm expanded based upon his friends and a small, roadside sales income. Steve is well-educated but has always erred on the side of "natural" foods and health whenever possible. He firmly believes that modern society should focus more upon tradition but is not willing to give up wireless internet, mobile phones, or his hybrid vehicle.
Profile	He has a mobile phone, which was a requirement for his previous job; he rarely worries about money thanks to a good retirement plan and several diverse investments; he was among the first people to own a personal computer and has had every form of internet from dial-up to a mobile card that provides wireless access no matter where he is now. Steve is not the farmer from the 2013 Dodge Super Bowl advertisement. He is more concerned with growing crops that he is interested in and that his few customers will be excited about. Steve's primary concern is to spread the idea of locovore eating from the perspective of a small acreage farmer.
Identifiers	If someone were to meet Steve they would be struck by his expensively rustic clothing that has been stained by his work. He has a well-kept beard and a stylish haircut but tries to project an air of appreciating things that are hip because they are old—driving a restored and hybrid-ized '57 Chevy pickup, wearing high-end flannel at all times.
Example Quotes	"We're trying to feed the world. Not make a million dollars." "If someone out there asks us if we can sell something or try growing something, we will." "If I had my way, I'd just grow what I want and influence people to buy it."

Note. *Steve was developed through interviews with six informants.*

The foil for Steve that developed during qualitative interviews for this study was "Kevin the Legacy Farmer" (*Table 7*). The growers who contributed to the development of Kevin were what might be described as stereotypical farmers. One study participant noted that he sat down with his crop brokers annually to determine what crops were holding steady in the market and what crops were less profitable before making any hard, fast decisions about what to plant the following year. "We have a 12-month growing season. I'm already starting to figure out what I'm going to plant next year," one informant stated. To remain competitive with areas of California that boast 12-month growing seasons, other study participants have added additional growing formats. "We have greenhouses to extend the growing seasons on both ends of the spectrum," noted another informant. Additionally, another informant discussed utilizing as many selling venues as possible to get the most out of their crop. "We utilize farmer's markets to sell less-than-perfect produce," the informant said.

Table 7.
Summary of the Kevin the Legacy Farmer persona.

Archetype Name	Kevin the Legacy Farmer
Demographics	Male Mid-40s White Rural
Background	Owner-manager of a 1,000-acre farm. He is a second-generation farmer with a small family. Kevin spends the majority of his waking hours either in the farm office, in the field or in his pickup driving from one farm plot to another. His major interests in agriculture are twofold: he would like to see his children pursue farming and he would like his farm to be at least mostly profitable as a business. Kevin has a Bachelor's degree in agronomy from his home-state, land-grant university. He does his best to be home to have supper with his family each night and tries to carve out time to go to school programs, kids' sports games, and Sunday church services.
Profile	Kevin grudgingly started carrying a mobile phone after having an accident in the field that left him stranded for several hours. He worries about making ends meet for his family and tries to save as much money at the end of each year as possible. He generally lets his wife take care of anything on the computer, not because he doesn't know how to use it but because he doesn't care for it. Kevin's primary concern is making his business as profitable as possible and taking care of his family. He is quiet, with a handful of very close friends but very few acquaintances, and spends any extra time he has with his family.
Identifiers	If someone were to meet Kevin they would notice his clothing was expensive once but has been made to last for several years. His boots are worn on top but have new soles because they have been re-soled. He wears a baseball cap with the logo for his son's team and has a deep, dark tan, even in winter, from his hours spent working outside.
Example Quotes	"It all comes down to the economy and at the end of the year you've got to look at what you have." "We believe in tremendous diversity and not having all your eggs in one basket." "Any crop I have going in, I want to have it as long as I can, especially early and late because then no one else has it."

Note. *Kevin was developed with responses from five informants.*

Interviews with Steve revealed that decision-making factors for this archetype were much different than those of the other farmer archetype. The factors effecting Steve's decision-making were, in some ways, in opposition to the factors the second farmer archetype weighed. Steve was generally less concerned about employing an affordable, reliable workforce and could generally set his own "market" prices at his road-side stand.

The driving forces for Kevin were those similar to other business owners with the additional pressure of trying to encourage continued family participation in the business. Ultimately, for Kevin, if the cost of labor increased or additional farm regulations were enacted by the state, his business, and by proxy his family, may suffer the consequences of those pressures. Kevin may weigh several factors while balancing the knowledge and equipment he has available to him with what is required to afford to continue running a farm operation.

Both archetypal farmers exhibited the self-efficacy that was assumed *a priori* as well as providing additional information related to their thoughts about consumers and farming in general. Steve interacted with consumers on a nearly daily basis and was, somewhat, attuned to their desires for specific items. However, some of the decision-making factors that pushed Steve's business were similar to those of Kevin. Steve may consider how new legislation could affect his ability to continue to grow certain crops and the ways in which those crops are grown as well as considering keeping his business competitive enough to stay afloat. Kevin, on the other hand, had very little direct contact with consumers who would eventually buy what he grew.

Both archetypes have common considerations as well. Steve and Kevin must both think about irrigation availability and soil health. Each archetype may approach irrigation and soil health in different ways but both must consider them. Irrigation availability has been an on-going concern in most of the state of California for many years. According to the United States Department of Agriculture Economic Research Service website, 2014 was the driest year on record for California. For Steve and Kevin the continued drought could mean weighing whether or not to change the crops they choose to grow, changing how they irrigate the crops they currently cultivate, or, ultimately, determining if they will continue to farm. Similarly, soil health, depending upon geographic location, could be a dramatic decision-making factor for Steve and Kevin.

Other archetypes

Interviews with representatives from farm bureaus in California yielded far less polarity in archetype. Each person interviewed was well-versed in both the concerns of farmers in their respective areas as well as the scuttlebutt from around the state. The familiarity of farm bureau representatives with their area growers, without the concern for business operations, offered a unique perspective in relation to the question of what factors influence farmers when making annual planting decisions (*Table 8*).

Table 8.
Summary of the Morgan the Socialite persona.

Archetype Name	Morgan the Socialite
Demographics	Female Mid-40s White Rural
Background	Director of a California-based farm bureau. Her father farmed for 45 years before retiring and leaving the farm to her brother. Morgan is aware of what is happening on her brother's farm but does not directly participate in the farming operation. She holds a degree in public relations from an out-of-state university but returned "home" to be a lobbyist. She began her professional career working in the capitol and then relocated to her home county when she settled into family life. Despite having a family, Morgan still wanted to have a hand in politics and became the director of the local farm bureau office.
Profile	Morgan loves being the clearing house for both official and unofficial information regarding farming in the area. She likes the feeling of still being involved in politics without the pressure of being at the capitol more often than not. The relaxed, familiar atmosphere of working in a community where she knows most of the people she is dealing with on a daily basis makes her work more pleasant than she imagined. While Morgan is primarily a slacks-and-blouse-with-pearls kind of woman, she has adapted to the less formal attire of jeans and blouse while in the office. The adaptation of her wardrobe is one part necessity (to save her more professional clothing from stains while walking through fields) and one part social compulsion (she has discovered farmers are more comfortable talking with her when she is dressed similarly to them).
Identifiers	Morgan is easy to spot. She is the woman dressed slightly nicer than everyone else in the room on any occasion. She is also noticeable because Morgan can speak with men and women alike and keep both forms of conversation moving smoothly with ease. Morgan is also the person who answers all the questions at farm bureau events and can be identified by the deference others show her during those encounters.

Table 8 continued.

Example Quotes	"Two top issues are water–we're in a drought and we've got some regulatory issues that are causing us to draw down our surface water– and over-regulatory action, too many agencies." "I've had growers speak to me about the way we hire immigrant labor. We have a strong Republican presence in the county that is resistant to immigration reform in terms of amnesty." "People are taking out annual, row crops. (Row crops have) been reduced because of pricing and water. Seasonal plantings are going to more permanent crops and we're seeing a much greater rate of return putting in orchards with micro/drip water applications as needed."

Note. *Morgan was developed after four interviews with California farm bureau directors.*

The final round of interviews was held with experts in irrigation and soil sciences from California (*Table 9*). The experts interviewed provided yet another perspective with regard to agricultural pursuits in California by offering expertise without discussing their specific agricultural opinions. Both experts provided information related specifically to their field and were open to further discussion if the need arose.

Table 9.
Summary of the Tom the Professor persona.

Archetype Name	Tom the Professor
Demographics	Male Mid-50s White Rural
Background	Scientist specializing in irrigation and hydrology. His father was a marine biologist and Tom grew up interested in water. He liked to hunt and fish as a child and carried that love of the outdoors into adulthood. Tom always wanted to follow a similar path to his father's but did not have a particular interest in biology. He chose hydrology and irrigation specialties after experiences interning at a fish hatchery and working as a sprinkler installer in high school.
Profile	Tom is quiet. He enjoys teaching at the local land-grant university and conducting hands-on courses for his students. Tom keeps up on what is going on state-wide as it relates to his area of expertise and keeps the broader picture in mind as well. His work consumes him, especially now that his shoulders make it too painful to fish. On the rare occasions he is not working, Tom still likes to hit up his favorite fishing holes and work on ways to modify his casting so make the sport less uncomfortable while still participating in it.
Identifiers	After a lifetime of spending his off-time alone, Tom rarely seeks the spotlight in any situation. He generally keeps to himself and the few close friends he has in the same area of study.
Example Quotes	"If you have a diversified farming operation you're going to have to make a choice between 'I'm going to keep my trees alive and fallow something.'" "The problem in California is that an acre may be taken out of production and a house is put on it with the same usage and then farms or subdivisions take over dry-land areas and convert them to irrigated farmland or housing." "In general, a well managed irrigation system can be pretty efficient but the question is how many of those are managed well? It's hard to do. You turn it on and turn it off in a small area but when you've got water going across varying soils it's difficult to determine."

Note. *Tom was developed based on two interviews. One interview with a soil specialist and one with an irrigation specialist.*

Each response, and perspective, provided via interviews yielded insight into a complex system of personal motivations and preferences, environmental and social influences, and inferred outcomes based upon previous experiences and habit. After gathering and analyzing responses from Steve, Kevin, Morgan, and Tom, the information was synthesized into a rank-order format data collection instrument to determine whether the information provided via interviews was consistent with the habits and preferences of other farmers in California.

Quantitative

After a series of interviews were conducted and interpreted in the qualitative stand of this study (QUAL → quan), a questionnaire was developed using qualitative findings to address the quantitative strand of the study. The questionnaire took into account the input provided by Steve, Kevin, Morgan, and Tom as well as including collection of demographic data. The instrument was provided to California farmers in both digital form via a survey maintained through Qualitrics and in a hard-copy form that was mailed with First Class postage to 200 pre-identified farmers.

The digital form of the questionnaire did not garner any responses despite unique URLs being generated and distributed to farmers via the first-contact postcard. The hard copy survey garnered a 29% (58 responses out of 200 instruments mailed) response rate (*Table 10*). Of the 29% of participants who responded, 30 respondents, or 52%, of the responses included completed questionnaires.

Table 10.
Descriptive Statistics summary of questionnaire constructs.

Construct	*n*	Minimum	Maximum	*M*	*SD*
Soil Mean Rank	30	1.00	5.00	3.41	1.28
Market Mean Rank	30	1.00	5.00	3.41	0.97
Water Mean Rank	30	1.00	5.00	3.13	1.39
Labor Mean Rank	30	1.25	5.00	3.08	0.92
Regulations Mean Rank	30	2.50	4.75	2.08	0.61

Note. *Study participants (n = 30) were asked to rank, in order of importance, (1 = least important, 5 = most important) each of the five constructs in a series of four questions.*

When examining the mean rank responses, the results of this study show soil quality was given the most consideration by respondents. However, there is not a great deal of fluctuation between the top four highly ranked areas of interest. In descending order, soil, market, water, and labor are all of high importance to respondents when weighing annual planting decisions. To get a better sense of how important each construct was, it was critical to look at each area individually and weigh the responses recorded for each response. The "soil" construct was answered nearly in full; three of the four soil-related questions garnered a 100% response rate (*Table 11*). The first soil-related question, which was related to soil quality was ranked 29 times out of 30 surveys returned.

Table 11
Soil quality construct rankings.

Soil quality construct rankings	*f*	%
2	2	6.9
3	12	41.4
4	10	34.5
5	5	17.2
Total	29	100.0

Note. *n = 30. The first question addressed in the questionnaire was related to planting decisions.*

In the first table, none of the study participants ranked "soil quality" as their most important decision-making factor when compared to "previous year sale price," "water accessibility," "workforce availability," and "Farm Bill subsidies." In relation to planting decisions in the first questionnaire question, soil quality was most often ranked as the third most important factor in that decision (n = 12). More than 50% of survey respondents noted that soil quality was ranked either third or fourth (n = 10, total of 75%), as it related the how planting decisions were made.

Table 12.
Soil moisture content construct rankings.

Soil moisture content rankings	*f*	%
1	3	10.0
2	8	26.7
3	10	33.3
4	6	20.0
5	3	10.0
Total	30	100.0

Note. *n = 30. The second survey question dealt primarily with harvesting decisions.*

When compared to "current market prices," "irrigation needs," "seasonal laborers," and "Food Safety Modernization Act" categories, "soil moisture content" was

largely reported to be of middling importance, with the majority of respondents (60%) marking it as the second or third most important decision-making factor they considered (*Table 12*).

Table 13.
Organic soil matter construct rankings.

Organic soil matter rankings	*f*	%
1	3	10.0
2	2	6.7
3	9	30.0
4	7	23.3
5	9	30.0
Total	30	100.0

Note. *n = 30. The third survey question focused on the planning and planting of rotational crops.*

"Organic soil matter" lagged behind when compared to "processor contracts," "irrigation costs," "number of employees needed," and "Periodic Smoke Inspection" when respondents weighed it in relation to the selection and planting of rotational crops (*Table 13*). "Processor contracts" deals largely with the habit of some farmers having signed contracts in place for a crop prior to planting. The contract ensures a set price for the crop or at least a promise of a premium. "Periodic Smoke Inspection" is directly related to regulations in California that require farmers to perform annual "smoke inspections" on fleets of two or more diesel trucks used in their farm operations (California Environmental Protection Agency). More than half of the survey respondents ranked "organic soil matter" as being either third or fifth most important when deciding what rotational crops to plant.

Table 14.
Soil quality construct rankings.

Soil quality rankings	*f*	%
2	3	10.0
3	14	46.7
4	7	23.3
5	6	20.0
Total	30	100.0

Note. *n = 30. The fourth survey question was related to determining whether a new crop is a wise addition to a farm operation.*

When looking more closely at the "soil" construct, it is noteworthy to see that very few farmers considered soil their most important guidance for annual crop planting. Despite it not being the first priority, the mean response of 3.41 out of 5, placed it as the most important cumulative decision-making factor for California agriculturalists. As evidenced in tables 11, 12, 13, and 14, soil was most frequently ranked the third most important decision-making factor for California farmers.

During the qualitative strand of this study several participants interviewed noted that no matter what crop they planted, there had to be a way for them to sell it. The "market" construct was ranked as the second most important decision-making factor overall for California farmers. Survey respondents provided 100% rankings for three of the four constructs. The "Processor contracts" construct dipped slightly with a 96.6% response rate.

Table 15
Previous year sale price construct rankings.

Previous year sale price rankings	*f*	%
1	2	6.7
2	10	33.3
3	4	13.3
4	5	16.7
5	9	30.0
Total	30	100.0

Note. *n = 30. The first survey question was related to planting decisions.*

Two schools of thought reigned with regard to "previous year's sale price" in relation to planting decisions in the survey responses (*Table 15*). Respondents were almost evenly split between considering it the second-most important part of the decision-making process (33%) and ranking it last in the decision-making process (30%). The two varying responses could be related to the other factors respondents were asked to weigh in the question. The responses may also be related to the existence of long-term contracts, pre-existing crop rotations, equipment ownership, or crop expertise.

Table 16.
Current market prices construct rankings.

Current market prices rankings	*f*	%
1	3	10.0
2	3	10.0
3	4	13.3
4	7	23.3
5	13	43.3
Total	30	100.0

Note. *n = 30. The second survey question was related to planning harvests.*

As might be expected, "current market prices" were ranked least important by respondents answering the second survey question (*Table 16*). In total, 43% of

respondents indicated that “current market prices” were the last factor guiding their harvest plans. One could posit that because crop maturity and season anecdotally determines harvest time, that market prices are not likely to drive producers to harvest earlier or later.

Table 17.
Processor contracts construct rankings.

Processor contracts rankings	*f*	%
1	5	17.2
2	7	24.1
3	7	24.1
4	5	17.2
5	5	17.2
Total	29	100.0

Note. *n = 30. The third survey question was related to the planning of rotational crops.*

Whether or not a contract with a processor was available did have some sway with survey respondents in relation to the planning of their rotational crops (*Table 17*). Almost half (46%) of survey respondents indicated that “processor contracts” were second- or third-most important to their decision-making when determining crop rotations.

Table 18.
Futures markets construct rankings.

Futures markets rankings	*f*	%
1	2	6.7
2	8	26.7
3	2	6.7
4	6	20.0
5	12	40.0
Total	30	100.0

Note. *n = 30. The fourth survey question was related to determining whether a new crop is a wise addition to a farm operation.*

"Futures markets" appeared to be among the least important factors for survey respondents weighing the introduction of a new crop (*Table 18*). Of 30 respondents, 12, or 40%, indicated that futures markets were the least important factor they considered when determining whether a new crop was a worthwhile enterprise for their respective businesses.

In the market construct, the strongest guiding principle for participants of this study appears to be "previous year sale price." Study participants evaluated "previous year sale price" as their second-most important decision-making factor in 33.3% of the questionnaires returned. However, there was a spilt in the data as 30% of respondents marked "previous year sale price" as the least important factor in determining the crop for the following year. In the market construct, it was the only truly split decision.

Despite the years-long drought in California, the "water" construct came in at the third most important overall decision-making factor agriculturalists weigh when determining what to plant. Survey respondents provided a 100% ranking of all constructs related to "water."

One survey respondent returned the questionnaire with the statement, "More water, less liberals" scrawled across the completed instrument. The struggles for water allotments in California have been widely noted in the media and documented through various information outlets. The middle-of-the-pack results of the questionnaire could simply be an under representation of agriculturalists in the areas of California most affected by the drought or it could indicate that survey respondents had yet to experience the recently reported affects of the drought when completing the questionnaire.

Table 19.
Water accessibility construct rankings.

Water accessibility rankings	*f*	%
1	7	23.3
2	6	20.0
3	1	3.3
4	4	13.3
5	12	40.0
Total	30	100.0

Note. *n = 30. The first survey question was related to planting decisions.*

When evaluating individual responses, the most frequent rank for "water accessibility" as a decision-making factor in planting decisions was last, or fifth, at 40% (*Table 19*). However, combining responses, gave an equal ranking to first- and second-most important (53%) as to fourth- and fifth-most important (53%).

Table 20.
Irrigation needs construct rankings.

Irrigation needs rankings	*f*	%
1	6	20.0
2	6	20.0
3	5	16.7
4	8	26.7
5	5	16.7
Total	30	100.0

Note. *n = 30. The second survey question was related to planning harvests.*

"Irrigation needs" in relation to planning harvests elicited a similar response split as "water accessibility" (*Table 20*). A combined 40% (20% each) ranked "irrigation needs" as first- and second-most important when it came to harvests. Eight survey respondents, or 26%, indicated that "irrigation needs" were the fourth-most important factor they considered when planning harvest.

Table 21.
Irrigation costs construct rankings.

Irrigation costs rankings	*f*	%
1	3	10.0
2	6	20.0
3	7	23.3
4	5	16.7
5	9	30.0
Total	30	100.0

Note. *n = 30. The third survey question was related to the planning of rotational crops.*

One-third of survey respondents, or nine people, indicated that "irrigation costs" were the least important factor that they considered when planning what rotational crops to plant (*Table 21*). The conjecture that might be made was that rotational crops are

likely a necessity and, therefore, the cost to cultivate those crops is less relevant than other considerations.

Table 22.
Water availability construct rankings.

Water availability rankings	*f*	%
1	11	36.7
2	3	10.0
3	3	10.0
4	4	13.3
5	9	30.0
Total	30	100.0

Note. *n = 30. The fourth survey question was related to determining whether a new crop is a wise addition to a farm operation.*

Implications of the drought in California, and how it is guiding the decisions of farmers in the state, were most evident in the last section of the water constructs (*Table 22*). "Water availability" was marked by 11 participants as the single most important decision-making factor they weighed when determining what crops to plant. "Irrigation costs" and "Irrigation needs" are somewhat evenly distributed on the 1 through 5 scale used to determine most to least important factors. Additionally, "Water accessibility" was ranked as the least important decision-making factor in the construct.

Labor considerations rank fourth overall in order of importance for California agriculturalists participating in this study. All questions related to labor received a 100% ranking by survey respondents but the question of "workforce availability" (*Table 23*), which was ranked 29 out of 30 times.

A workforce for harvests and general farm labor was mentioned as being foremost among the concerns of farmers in contact with farm bureau directors who were interviewed for the qualitative strand of this study. The survey responses were in disagreement with that perspective. With an overall ranking of fourth-most important, labor seemed to fall by the wayside in the decision-making of agriculturalists who responded to this survey.

Table 23.
Workforce availability construct rankings.

Workforce availability rankings	*f*	%
1	3	10.3
2	4	13.8
3	10	34.5
4	7	24.1
5	5	17.2
Total	29	100.0

Note. *n = 30. The first survey question was related to planting decisions.*

"Workforce availability" was considered somewhat important by survey respondents. Exactly one-third (33.3%) of respondents indicated that an available workforce was the third-most important factor that helped determine their planting decisions.

Table 24.
Seasonal laborers construct rankings.

Seasonal laborers rankings	*f*	%
1	5	16.7
2	6	20.0
3	7	23.3
4	7	23.3
5	5	16.7
Total	30	100.0

Note. *n = 30. The second survey question was related to planning harvests.*

The distribution of responses related to the need for seasonal laborers when planning harvests was relatively even across the data (*Table 24*). The most frequently occurring rank regarding the importance of seasonal laborers was third and fourth, with each rank being chosen seven times by survey respondents.

Table 25.
Number of employees needed construct rankings.

Number of employees needed rankings	*f*	%
1	4	13.3
2	8	26.7
3	5	16.7
4	10	33.3
5	3	10.0
Total	30	100.0

Note. *n = 30. The third survey question was related to the planning of rotational crops.*

When planning a crop rotation, the "number of employees needed" (*Table 25*) for growth and harvest of that crop was considered by most survey responses to be fourth-most important in guiding their decisions (10 or 33%). Nearly as many (8 or 26%) indicated that "number of employees needed" was the second-most important factor they considered when looking at rotational crop planning.

Table 26.
Labor needs construct rankings.

Labor needs rankings	*f*	%
1	1	3.3
2	8	26.7
3	9	30.0
4	11	36.7
5	1	3.3
Total	30	100.0

Note. *n = 30. The fourth survey question was related to determining whether a new crop is a wise addition to a farm operation.*

"Labor needs" was considered to be somewhere between the second- and fourth-most important factors that guided the decision-making of survey respondents when they were considering planting a new crop (*Table 26*). The responses were weighted toward the fourth-most important (11 respondents or 36%) but nine (30%) considered it third-most important and eight (26%) considered it the second-most important factor in determining whether or not to plant a new crop.

The labor construct appears to suggest that labor is important when making decisions about what crops to plant annually in California but not crucial. A number of environmental determinants may be driving that decision-making including, but not limited to, mechanization, costs, and type of crop being grown. The scope of this study did not delve specifically into labor motivations but numerous factors may be considered in further study.

The inclusion of "regulation" in the decision-making factors was largely guided by the data collected in interviews with farm bureau directors. Two of the regulation-related constructs were ranked by all 30 survey respondents while the other two—

periodic smoke inspection and immigration reform—were answered by 96.7% of respondents respectively. Farm bureau directors indicated that their constituency was greatly concerned by regulations restricting their ability to farm. Additionally, anecdotal evidence suggested that California was the most agriculturally regulated state in the United States, thus warranting further data collection related to how much regulation factored into the decision-making of California-based farmers.

Table 27.
Farm Bill subsidies construct rankings.

Farm Bill subsidies rankings	*f*	%
1	16	53.3
2	6	20.0
3	3	10.0
4	1	3.3
5	4	13.3
Total	30	100.0

Note. *n = 30. The first survey question was related to planting decisions.*

The majority of survey respondents considered "Farm Bill subsidies" either the most important (53%) or the second-most important (20%) factor weighed when determining what crops to plant (*Table 27*). The 73% top-end response to Farm Bill subsidies being an important decision-making factor suggested that California farmers closely follow what crops will be subsidized and plant crops accordingly.

Table 28.
Food Safety Modernization Act construct rankings.

Food Safety Modernization Act rankings	*f*	%
1	17	56.7
2	4	13.3
3	3	10.0
4	1	3.3
5	5	16.7
Total	30	100.0

Note. *n = 30. The second survey question was related to planning harvests.*

The "Food Safety Modernization Act," is a piece of legislation with provisions for how food is produced, how and what livestock are fed, among other things (*Table 28*). The majority of survey respondents considered it an extremely important part of harvest planning, with 56% (or 17 respondents) ranking it first among their priorities. The attention to the Food Safety Modernization Act could, in part, contribute to the perceived changes to production, production costs, and returns on investments.

Table 29.
Periodic Smoke Inspection construct rankings.

Periodic Smoke Inspection rankings	*f*	%
1	16	55.2
2	5	17.3
3	3	10.3
4	1	3.4
5	4	13.8
Total	29	100.0

Note. *n = 30. The third survey question was related to the planning of rotational crops.*

"Periodic Smoke Inspection," again ranked highest among decision-making factors weighed when planning rotational crops (*Table 29*). More than one-half of the

survey respondents (55.2%) ranked Periodic Smoke Inspection as their top priority in relation to rotational crops.

Table 30.
Immigration reform construct rankings.

Immigration reform rankings	*f*	%
1	14	48.3
2	10	34.5
4	2	6.9
5	3	10.3
Total	29	100.0

Note. *n = 30. The fourth survey question was related to determining whether a new crop is a wise addition to a farm operation.*

"Immigration reform" was also considered important to survey respondents (*Table 30*). Nearly half of survey respondents (48.3%) ranked immigration reform as the most important thing they considered when deciding whether or not to plant a new crop on their farm. Because the question is somewhat vague, it is difficult to determine whether "immigration reform" ranking first is truly related to the planting of new crops or to political leanings.

Despite being the least important, decision-making factor overall, regulations were clearly an important individual factor for California agriculturalists. Several study participants indicated that all forms of regulatory action were high priorities, with 53.3% ranking "Farm Bill subsidies" as their most important decision making factor in the first survey question. Fifty-seven percent of study participants indicated that the "Food Safety Modernization Act" was their most important decision-making factor in the second survey question. In the third survey question, 55.2% of study participants noted that

"Periodic Smoke Inspection" was their most important decision-making factor. Finally, in the fourth survey question, 48.3 of participants indicated that "immigration reform" was their most important decision-making factor.

The focus of California producers may indicate more study could be done focusing on how regulations affect farmers in California. Additionally, further study in how political leanings shape perspectives on agricultural regulatory actions may also be a worthwhile avenue to study. In the instance of "immigration reform," "Farm Bill subsidies," and the "Food Safety Modernization Act," it was important to note that high rankings of each item may have been directly connected to the respondent's political point of view.

Responses by geography

It is easy to consider a whole state as having a similar demographic throughout its whole; however, that is not always the case. Theoretically, California could be broken into three regions: Northern California, the Central Valley, and Southern California (*Table 31*). With regional divisions taken into consideration, survey responses may be viewed from a different perspective.

Table 31.
Recorded responses by county.

County	Number of responses
Fresno	5
Kings	3
Yolo	3
Riverside	3
Santa Cruz	2
Santa Barbara	2
Monterey	2
Merced	2
Kern	2
Butte	1
Solano	1
Stanislaus	1
Contra Costa	1
Colusa	1
Sutter	1
Madera	1
Nevada	1

Note. *n = 33. Responses by county were determined by matching the questionnaire identification number with the address to which the questionnaire was sent.*

Of the 33 useable questionnaires returned, 20 questionnaires (64.5%) were returned from the Central Valley region of California. The Central Valley of California includes Butte, Colusa, Glen, El Dorado, Fresno, Kern, Kings, Madera, Merced, Placer, San Joaquin, Sacramento, Shasta, Stanislaus, Sutter, Tehama, Tulare, Yuba and Yolo counties. The Central Valley accounted for 44.5% ($42.6 million dollars) of California's agricultural sales (USDA Farm Census 2012). Six responses (19%) were returned from coastal counties of Monterey, Santa Cruz and Santa Barbara; three responses (9.6%) were submitted from Riverside County in Southern California; two responses (6.5%) were returned from Solano and Contra Costa counties, west of the Central Valley; and one response (3.1%) was submitted from Nevada County in Northern California.

Fresno, Kern, and Madera counties are among the top agriculture sales counties in the United States (Umbach, 1997). Because the qualifiers used to sort the ReferenceUSA database that created the list of potential study participants were agriculture-related, it may have highlighted the Central Valley as an area with a high concentration of agricultural producers. Additionally, there is the potential that a higher rate of concentrated mailings to that specific area, helped to bolster the response rates from the Central Valley. However, the high rate of returned questionnaires from the Central Valley may also indicate a willingness to engage in research.

Recommendations

The primary focus of this mixed methods sequential (QUAL → quan) study was to develop an instrument that would help determine the decision-making factors that guide California-based agriculturalists in their annual crop planning and planting. The qualitative strand of the study provided the basis for the quantitative strand of the study by making available a pool of recurring themes from which to distill factors that were most likely to guide the decisions of California-based farmers. Numerous phone interviews during a three month period shed light on the concerns of California farmers including soil quality, water availability, bottom-line income, workforce accessibility, and over-regulation. The concerns of producers highlighted via phone interviews were confirmed by California farm bureau directors and water and soil specialists in California. After phone interviews were completed, a questionnaire was developed for distribution to California-based agriculturalists requesting that they rank from highest to lowest (1 = lowest and 5 = highest) the importance of soil quality, water availability,

marketing/income, workforce accessibility, and regulation in their decision-making about crop planting, harvesting, introduction of new crops, and crop rotations. Survey data showed that although the broad-stroke ideas were present in the instrument, there were numerous other questions worth examining beyond this study.

The qualitative strand of this study highlighted the question of jargon, vernacular and assumptions about what agriculture means. Based upon my personal experiences as a third-generation farmer from Washington state and comparing those experiences to the experiences and descriptions of agriculture in California, it was clear that "farming" is a multifaceted and many layered ideal that deserves additional examination. The first question that came to mind was, quite simply, "What is farming?" As the "farmer archetypes" developed for the qualitative strand of this study suggested, farming means different things to different people whether they are operators or, potentially, consumers.

Additionally, the language of farming appeared to differ depending upon locale. For instance, when interviewing water specialists in California, the vernacular of irrigation systems varied based upon where the interviewee was from and where they were currently residing. If vernacular changes based upon locale—just as regional speech can be indentified throughout the United States—it may be a question of regional farming dialect. In popular culture, the Southern expression of "y'all" is transposed in Northern regions as "you all." In agricultural vernacular, a "pivot" may be translated into a "circle" based on a similar geographic line. Additional research dealing specifically with the language of agriculture may add further insight into how better to communicate a producer perspective to a consumer and vice versa.

The quantitative strand of this study uncovered another set of questions outside the scope of the study that may be worthy of further research. Particularly, questions related to the relationship between regulatory efforts and agriculture, the age and experience of currently operating agriculturalists, and further research that specifically focuses upon the five constructs researched generally in this study. All three areas of research may provide additional insight into agriculture as a culture, which may, in turn, offer more opportunities to bridge the communication gap between agriculturalists and the general public.

Participants in this study indicated a high interest in regulatory actions taken by governmental agencies. Delving deeper into the context of regulatory actions was well beyond the scope of this study however, there is an opportunity to further expand on this preliminary research. Questions related to why regulatory actions are of such high interest and how agriculturalists believe those actions will affect them may provide new information for people outside agriculture. If farmers can adequately communicate why and how regulatory actions shape their production, they may be able to influence the enacting of such measures.

Similarly, research related to whether interest in regulatory actions is related to political leanings may be worth additional study. Anecdotally, the rest of the United States identifies the West Coast, and California in particular, as the "Left Coast" (Krugman, 2014). However, interviews with California farm bureau directors suggested a strong conservative vein of politics within the agricultural community. There is the potential that high interest in "immigration reform," "Farm Bill subsidies," and the other

regulatory items presented in the questionnaire may be related less to a farmer's decision-making and more to his or her personal beliefs and political ideals.

This study worked with an *a priori* notion that California-based agriculturalists were capable of making their own decisions with little, or no, guidance from outside influences. Anecdotally, society assumes that with age comes wisdom. Following that logic, the average farmer in the United States should possess a wealth of knowledge about their profession and the crops and/or livestock that are the bulk of that profession. However, future ethnographic research chronicling the questions of wisdom and age in agriculture may, yet, uncover additional information that could be adapted for use by agriculturalists with little, or no, experience.

An expansion of the five major constructs of this study—soil, water, labor, market, and regulations—would provide a greater depth of knowledge beyond what this study highlighted. Each construct is important individually for diverse reasons and researching the details of each construct could ultimately provide further data for both qualitative and quantitative researchers. For instance, researching the motivations of agriculturalists in drought-stricken areas may give researchers additional ideas about how to address the needs of agriculturalists.

Beyond the expansion of the five major constructs of this study were additional decision-making factors that may be worth further study. Operating costs were not specifically addressed by the instrument developed for this study. The costs associated with planting, harvests, rotational and new crops were not explored in this study. It is possible that a perceived increase in costs may be a decision-making factor that was not

studied. Similar to operating cost factors, were long-term versus short-term crops. One California farm bureau director indicated that farmers in his or her area were in the process of switching from irrigation-intensive annual crops to more drought-resistant long-term crops (e.g., from lettuce to almond groves). For some farmers, the difference—even more specifically than simply weighing the "planting of new crops"—between long-term and short-term crops may be an over-arching decision-making factor for the survival of their farm as a whole. Also connected to long- versus short-term crops was region. The region of the survey respondents was collected based upon the request for a zip code; however, the zip code request does not specifically address the needs and challenges for farmers operating in that area of California. Additional study that is region-specific may shed new light on other decision-making factors for California-based agriculturalists.

Methodology was not immune to sparking questions related to this study. The distribution of the instrument developed for this study followed the Dillman (2003) method to the letter but did not garner the response rate (80%) that Dillman (2003) suggested was possible. In addition to the physical copies of the instrument that were distributed, unique, shortened URLs were assigned to each potential survey respondent and given to each potential respondent via the pre-notice postcard that was delivered via first class mail. Some research (Hill, Dean, & Murphy, 2014) has suggested that a movement toward digitally administered research is the next step in data collection. However, of the 200 unique shortened URLs created for potential survey respondents, none were visited. Research delving into the demographics of populations more likely to

use a digital format instrument versus people more likely to respond to a hard copy questionnaire may offer additional insight into what format offers the best response rate for a given group.

This study focused primarily upon identifying the decision-making factors that farmers in California weigh when determining what they will plant annually. Future decision-making factors research in greater depth may lead to a better understanding of the motivations of agriculturalists. Subsequent studies may use this study as a stepping stone in refining the instrument developed for this study or as a guide for researching additional avenues related to the qualitative and quantitative strands of this study.

CHAPTER IV

CONCLUSIONS

Mixed method studies (QUAL → quan) focused on the study of what motivates agriculturalists to pursue their chosen profession are few and far between. The application of Bandura's (1986) social cognitive theory to this segment of the population was rarer still. Some *a priori* assumptions were made with regard to one of the central tenants of Bandura's (1986) theory—self-efficacy—as it related to potential study participants. It could be argued that farming is a solitary activity with little or no input from an outside source and, as such, requires agriculturalists to believe in their own abilities to make decisions and fulfill goals. *A priori* assumptions about the self-efficacy of agriculturalists was not an assumption that disregarded the function of consumers or the marketplace but rather an assumption that farmers could get their crop raised to the point of harvest and eventual sale. The purpose of this study was, in part, to develop an instrument to determine what decision-making factors agriculturalists in California weigh when making annual crop planting choices.

By acknowledging that farmers operate with a high degree of self-efficacy, it was a given that there were several factors that were considered with each decision about the operation of the farm. It was paramount to first determine what factors California-based agriculturalists weigh. From a personal perspective, I could theorize about what factors might play into the decisions of farmers. However, during the course of the study, it was apparent that factors weighed by farmers in the Northwest did not necessarily correspond to the factors weighed by farmers in California. To discover what factors

California farmers considered when making annual planting decisions, a series of 15 interviews were conducted during the course of three months via phone calls.

Each interview involved a unique study participant that had some similar concerns to those of other study participants. The similarities of the interviewed study participants were more apparent but the many similarities made the disparities more striking. Some farmers interviewed were deeply concerned about how to keep their farms afloat; whereas, others were more concerned about shaping their consumers to fit the personal desires of the farmer. To outline the differences among the farmers interviewed, two archetypes were developed to provide a mental image to separate one type of interviewee from another as well as providing a way to categorize their unique responses.

After grower interviews were concluded, interviews with California farm bureau directors as well as soil and irrigation specialists were conducted to further confirm or refute the data collected from agriculturalists. By and large, the California farm bureau directors and specialists concurred with the data collected from the interviewed farmers. California farm bureau directors did offer additional insights and suggestions to add to the pool of possible decision-making factors such as “regulations” to the data previously collected. Interviews with specialists in soil and water provided additional insight into how to frame questions regarding both subjects.

Upon completion of all the interviews, or the qualitative strand of the study, an instrument was developed to rank the importance of the decision-making factors determined to be most relevant to California agricultural producers. Among the decision-

making factors determined to be relevant to California agricultural producers were soil quality, water availability, markets, labor, and regulations. Each decision-making factor was presented within the framework of a specific decision-making task (planning harvest, selecting rotational crops, determining production of a new crop, and planting of annual crops). By asking survey respondents to consider each decision-making factor within a task, it offered a point of reference for the specific construct.

A review of the resulting questionnaire responses revealed that, in some ways, all the decision-making factors listed in the questionnaire (water, soil, markets, regulations, and labor) were important to survey respondents. Varying degrees of importance were recorded for each of the decision-making factors but, in each construct, at least one study participant noted that one, or more, of the decision-making factors was the "most important" consideration they made when determining what crops to cultivate annually. During the evaluation of completed questionnaires, it became clear there were additional factors not identified in the initial interviews that might have strengthened the study's results. Among the decision-making factors this study did not measure were political affiliation, operation costs, and region of California. The inclusion of those additional factors may have provided further insight into the survey respondents.

Two specific points should be emphasized as conclusions of this study: First, and foremost, it was clear that decision-making is a complex process that simultaneously takes into account several factors at once. Ultimately, the decision reached is likely a compromise between the ideal and the best option available. Secondly, the need for further study of the decision-making processes of farmers became clear. Similar such

studies appeared to be nearly impossible to find in the current literature. By beginning an exploration of what drives the decisions of California farmers, this study, through subsequent studies, may shed light on how to better facilitate communication between agriculturalists and the general public.

This study uncovered that there are factors that guide the decisions of the California agriculturalists who participated in this study. The study participants balance their concerns about water availability, soil quality, market demands, state regulations, and labor requirements against what crops they choose to plant and when they choose to plant and harvest them. The hope was that this study would become a stepping stone for additional study that would explore potentially unidentified decision-making factors and be adapted to studies of either the specific decision-making factors individually or move forward by using the decision-making factors identified in conjunction with other pursuits in communications, marketing, advertising, consumer outreach, or any other number of areas. Being able to identify five general decision-making factors that guide the decisions of agriculturalists suggested that there may be other decision-making factors that have not been identified and that the factors identified were worthy of more in-depth study than was part of the scope of this study.

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4	2	0	0	1

Considerations for Annual Crop Planting

Throughout this survey you will be asked to rank, in order of importance, the factors that influence what crops you plant annually. Please consider all of the questions carefully and rank the factors to best reflect what is important to you. Please rank the most important item with a "5" and the least important item with a "1." It is important that you assign a number between "5" and "1" to each item.

Note all information will be kept strictly confidential.
Thank you for your time and participation!

5 = most important, 1 = least important

Example only When I plan my annual crop, I consider	[4] Soil	[5] Labor	[1] Water	[3] Regulations	[2] Market
When I plan my annual crop, I consider	☐ Soil quality	☐ Workforce availability	☐ Water accessibility	☐ Farm Bill subsidies	☐ Previous year sale price
When I plan harvest, I consider	☐ Current market prices	☐ Irrigation needs	☐ Seasonal laborers	☐ Soil moisture content	☐ Food Safety Modernization Act
When I plan rotational crops, I consider	☐ Organic soil matter	☐ Processor contracts	☐ Irrigation costs	☐ Number of employees needed	☐ Periodic Smoke Inspection
When I plant a new crop, I consider	☐ Labor needs	☐ Water availability	☐ Soil quality	☐ Immigration reform	☐ Futures markets

What crops do you grow?

Five more questions are located on the back of this sheet.

TEXAS A&M UNIVERSITY

CALIFORNIA FARM BUREAU FEDERATION

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4	2	0	0	1

Considerations for Annual Crop Planting

In this section, please write in the number of acres, year and years for each answer.

How many acres do you farm?	
How many acres do you own?	
How many acres do you lease?	
In what year were you born?	
How many years have you farmed?	

Thank you for your time!

APPENDIX B


TEXAS A&M
UNIVERSITY
Joe Farmer
135 Farm Plot Rd
Fresno, CA XXXXX-XXXX

Sept. 11, 2013

In the next few days I will be sending you some questions in the mail about annual crop planting decisions. I am telling you about this now so you are not surprised I am asking questions.

To help save time and money, you can go online now and complete the short survey here:

http://XXXXXXXXXXXXXXXXXX.com

If you have any questions about this survey, please contact me on my cell phone or by e-mail. Thank you in advance for your help and time.

Pamela Robel

509-750-2238
pamela.robel@agnet.tamu.edu

APPENDIX C


TEXAS A&M
UNIVERSITY
Joe Farmer
135 Farm Plot Rd
Fresno, CA XXXXX-XXXX

Sept. 12, 2013

Last week, a survey seeking information about your crop planting decisions was mailed to you. The survey deals with the factors that determine what you will plant annually.

If you have already completed and returned the survey, please accept my sincere thanks. If not, I would appreciate you returning it as soon as possible. It is important that your response be included in the study if the results are to accurately represent California farmers.

Sincerely,

Pamela Robel

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pamela.robel@agnet.tamu.edu